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HOME CANNING

of fruits and vegetables

Points for Success

- Can only fresh food, in tiptop condition.
- Use boiling-water bath for fruits and tomatoes.
Use steam-pressure canner for other vegetables.
- Have equipment in good working order.
- Follow up-to-date directions backed by research.

U. S. DEPARTMENT OF AGRICULTURE

AIS-64

RIGHT METHOD FOR EACH FOOD

In the air, water, and soil at all times, there are tiny organisms — molds, yeasts, and bacteria — that cause food spoilage. Also, fresh fruits and vegetables contain enzymes that may cause undesirable changes in color, flavor, and texture.

When you can fruits and vegetables, you heat them hot enough and long enough to stop the action of the enzymes and to destroy the spoilage organisms. You seal containers so no more of these organisms can get in. Heating in a canner is called processing.

For fruits, tomatoes, pickled vegetables. — Use a boiling-water

bath. You can process these acid foods safely in boiling water.

For corn, beans, other common vegetables (except tomatoes). — Use a steam-pressure canner. To process these foods safely in a reasonable time takes a temperature higher than that of boiling water. The best way to get this temperature is to hold steam under pressure.

If you have no pressure canner, team with someone who has. Or maybe you can go to a community canning center and use pressure equipment.

GET YOUR EQUIPMENT READY

Steam-Pressure Canner

For safe operation of your canner, clean pet-cock and safety-valve openings by drawing a string or narrow strip of cloth through them. Do this at beginning of canning season and often during the season.

Check pressure gage. — An accurate pressure gage is necessary to get the processing temperatures needed to make food keep.

A **weighted gage** needs only to be thoroughly clean.

A **dial gage**, old or new, should be checked before the canning season, and also during the season if you use the canner often. Ask your county home demonstration agent, dealer, or manufacturer about checking it.

If your gage is off 5 pounds or more, you'd better get a new one. But if the gage is not more than 4 pounds off, you can correct for it as shown below. As a reminder, tie on the canner a tag stating the reading to use to get the correct pressure.

The food is to be processed at 10 pounds steam pressure; so—

If the gage reads high—

- 1 pound high—process at 11 pounds.
- 2 pounds high—process at 12 pounds.
- 3 pounds high—process at 13 pounds.
- 4 pounds high—process at 14 pounds.

If the gage reads low—

- 1 pound low—process at 9 pounds.
- 2 pounds low—process at 8 pounds.
- 3 pounds low—process at 7 pounds.
- 4 pounds low—process at 6 pounds.

Have canner thoroughly clean. — Wash canner kettle well if you have not used it for some time. Don't put cover in water — wipe it with a soapy cloth, then with a damp, clean cloth. Dry well.

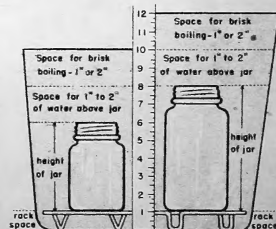
Water-Bath Canner

Any big, clean vessel will do for a boiling-water-bath canner if it's deep enough to have an inch or two of water over the tops of the jars and a little extra space for boiling . . . if it has a cover . . . and a rack to keep the jars from touching bottom.

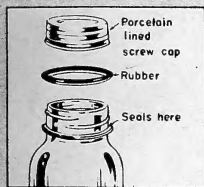
The rack may be of wire or wood. Have partitions in rack, if possible, to keep jars from touching one another or falling against the side of the canner.

If a steam-pressure canner is deep enough, you can use that for a water bath. Set the cover in place without fastening it. And be sure to have the pet cock wide open, so that steam escapes and no pressure is built up.

Your water-bath canner may be of aluminum, tin, galvanized iron, or enameled ware. Whatever the material, be sure canner is deep enough so water can boil well over tops of containers.



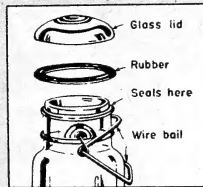
If you use glass jars . . . Main types of closures and how to use them



Porcelain-lined zinc cap with shoulder rubber ring, to fit standard mason jar.

When canning. — Fit wet rubber ring down on jar shoulder, but don't stretch more than necessary. Fill jar; wipe the rubber ring and the jar rim clean. Then screw cap down firmly and turn it back $\frac{1}{4}$ inch.

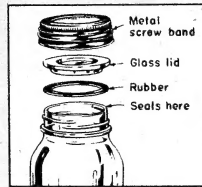
After canning. — As soon as you take jar from canner, screw cap down tight, to complete seal.



Wire-bail type jar with glass lid and rubber ring.

When canning. — Fit wet rubber ring on ledge at top of empty jar. Fill jar; wipe rubber ring and jar rim clean. Put on glass lid. Push long wire over top of lid, so it fits into groove. Leave short wire up.

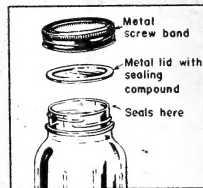
After canning. — As soon as you take jar from canner, push short wire down, to complete seal.



Glass lid and top-seal rubber ring, with metal screw band, to fit standard mason jar.

When canning. — Fill jar; wipe rim clean. Fit wet rubber ring on glass lid. Put lid on jar, rubber side down. Screw band on until it is almost tight. Then, turn back almost a quarter turn, but be sure jar and band mesh. Caution: If band is screwed too tight, jar may break.

After canning. — As soon as you take jar from canner, screw band down tight, to complete seal.



Flat metal lid with sealing compound, with metal screw band, to fit standard mason jar.

When canning. — Fill jar; wipe rim clean. Put lid on with sealing compound next to glass. Screw metal band down tight by hand...do not use a wrench. When band is screwed firmly, this lid has enough give to let air escape during processing.

After canning. — This is a self-sealing type. Don't tighten further when you take jar from canner; you may break the seal.

Before you start to can

Check and wash jars and lids. — Whatever kind of jars and lids you use, be sure they are perfect and clean. Discard any with cracks, chips, or dents — defects prevent airtight seals. Using jars and closures from the same manufacturer may help insure a seal. Screw bands for glass and metal lids cannot be interchanged.

Wash glass jars in hot, soapy water and rinse well. Also wash and rinse all lids except those with sealing compound. Heat the washed jars and lids in clean water just before using. Some metal lids with sealing com-

pound need boiling; others only a dip in hot water. Follow the manufacturer's directions.

Get rubber rings ready. — If you use rubber rings, have clean, new rings of the right size for the jars. Don't test by stretching.

To help prevent rubber jar rings from flavoring food. — First scrub rings with a brush in hot, soapy water. For each dozen use 1 tablespoon baking soda to 1 quart cold water and put the rings in this solution. Bring to boiling; boil uncovered 10 minutes. Rinse well.

IF YOU USE TIN CANS

Types of tin cans.—Plain tin, C-enamel (corn enamel), and R-enamel (sanitary or standard enamel) are the types used in home canning.

Enameled cans are recommended for certain fruits and vegetables to prevent discoloring, but are not necessary for a wholesome product.

C-enamel cans are used for—

Green lima beans

Corn

Carrots

R-enamel cans are used for—

Beets
Berries
Cherries, red

Fruit juices
Plums
Pumpkin

Rhubarb
Sauerkraut
Squash

Strawberries
Sweet potatoes

Use plain tin for—

Apples
Apricots
Asparagus

Beans, snap
Cherries, light
Okra

Peaches
Pears
Peas

Spinach
Tomatoes

Sizes to use:

No. 2 can—holds about $2\frac{1}{2}$ cups (20 ounces)

No. $2\frac{1}{2}$ can—holds about $3\frac{1}{2}$ cups (28 ounces)

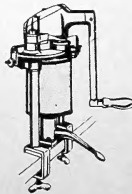


Use cans in good condition.—See that cans, lids, and gaskets are perfect. Discard badly bent, dented, or rusted cans and lids with scratched or torn gaskets. Keep lids in paper packing until ready for use. The paper protects the lids from dirt and moisture.

Just before use.—Wash cans in clean water; drain upside down. Do not wash lids; washing may damage the gasket. If lids are dusty or dirty, wipe with a damp cloth just before putting on cans.

Tin cans need a sealer.—Before you buy tin cans, be sure you have a sealer in good working order. Or arrange to can in tin at a community center where a sealer is available.

Make sure the sealer you use is properly adjusted. To test, put a little water into a can, seal it, then submerge can in boiling water for a few seconds. If air bubbles rise from the can, the seam is not tight. Adjust sealer, following manufacturer's directions.



POINTS ON CANNING

Fruits — Fresh, Ripe, Clean

Choose fresh, firm fruits and can them quickly. If you must hold them, keep them cool and well-ventilated. Try to get local produce if you buy fruits to can.

Sort fruits for size and ripeness—they cook more evenly. For best flavor and appearance in the canned product, use only perfect fruit.

Wash fruits thoroughly. Dirt contains some of the bacteria hardest to kill. Wash small lots of fruit at a time, under running water if possible, or through several changes of water. Lift food out of water each time so dirt that's been washed off won't be drained back over it. Rinse pan thoroughly between washings. Don't let food soak—you lose food value. Handle fruit gently to avoid bruising.

Two Ways to Pack

In this publication directions for packing hot are given for all the foods. For some fruits and for tomatoes, directions are also given for the cold-pack method.

Hot pack.—Food is heated before it is put into containers. Fruits may be heated in sirup, in water or steam, or in extracted juice. Or juicy fruits may be packed hot in their own juice—that is, in the juice that cooks out when they are heated without added liquid. Tomatoes also are packed in their own juice.

Have the food near boiling when filling either glass jars or tin cans. Pack fairly loosely, filling containers as directed for the food you are canning (pp. 10 to 12).

Cold pack.—Cold, raw fruits are put into containers and covered with hot liquid—sirup, water, or juice. Tomatoes packed cold are pressed down in the containers so they are covered with their own juice, and no liquid is added. Raw foods may be packed tighter than hot foods since they shrink during processing.

For hot or cold pack, it takes from $\frac{3}{4}$ to 1 cup liquid to a quart glass jar or a No. $2\frac{1}{2}$ tin can to fill in around solid food.

FRUITS, TOMATOES, PICKLED VEGETABLES

Exhausting Tin Cans

With tin cans, the temperature of the food must be 170° F. or higher when the cans are sealed. Food is heated to drive out air and help prevent discoloring and loss of flavor. Also, sealing hot prevents bulging of can ends and breaking of seams. You can get the right sealing temperature by packing food hot or heating it in the open cans (exhausting) or both. Even when food is packed hot, you'll need to reheat it before sealing the cans if the temperature has fallen below 170°. It is best to have a thermometer for checking temperatures of cans.

To exhaust, heat the open, filled cans of fruit in boiling water according to the directions on page 11.

Remove cans from water one at a time. Replace any liquid spilled from can by filling to the top with boiling packing liquid or with boiling water. Place clean lid on filled can. Seal at once.

Processing in Boiling-Water Bath

For cold pack in glass jars have water in the canner hot but not boiling, to prevent breakage. For all other packs have water boiling.

Put filled glass jars or tin cans in canner. Add boiling water if needed to bring water an inch or two over tops of containers. Don't pour boiling water directly on glass jars. Put cover on canner.

Count time as soon as water comes to a rolling boil. Then boil gently and steadily for the time given in the directions for the food you are canning (pp. 10 to 12). Add boiling water during processing if needed to keep the containers of food covered.

Out of the Canner

Glass jars.—As you take jars from the canner, complete the seals at once if jars do not have self-sealing-type closures. The directions on page 3 tell what to do with each kind.

If liquid has boiled out in canning, seal the jar just as it is. Do not open to put in more liquid.

Cool jars top side up. Give each jar room so air can get to all sides. Never set a hot jar on a cold surface or in a draft—sudden cooling may break a jar. Do not cover jars while they are cooling.

Tin cans.—Cool tin cans quickly in cold, clean water, using as many changes of water as necessary to cool them rapidly. Take them out of the water while they are slightly warm so they will dry in the air. Stagger cans if you stack them, so air can get around them.

TO FIGURE YIELD OF CANNED FRUIT FROM FRESH

Legal weight of a bushel of fruit varies in different States. These are average weights:

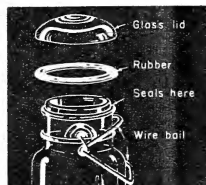
Food	Fresh	Canned
Apples	1 bu. (48 lb.) 2½ to 3 lb.	16 to 20 qt. 1 qt.
Berries, except strawberries	24-qt. crate 5 to 8 cups	12 to 18 qt. 1 qt.
Cherries, as picked	1 bu. (56 lb.) 6 to 8 cups	22 to 32 qt. 1 qt.
Peaches	1 bu. (48 lb.) 2 to 2½ lb.	18 to 24 qt. 1 qt.
Pears	1 bu. (50 lb.) 2 to 2½ lb.	20 to 25 qt. 1 qt.
Plums	1 bu. (56 lb.) 2 to 2½ lb.	24 to 30 qt. 1 qt.
Strawberries	24-qt. crate 6 to 8 cups	12 to 16 qt. 1 qt.
Tomatoes	1 bu. (53 lb.) 2½ to 3 lb.	15 to 20 qt. 1 qt.



HOW TO HOT-PACK FRUITS . . .

Any fruit may be canned much like this (pp. 10 to 12). And you can use any of the jars described on page 3, or tin cans, page 4.

These pictures show the wire-bail-type jar.



To Sweeten Fruit

To sweeten fruit you can make a sugar sirup as shown for peaches. Or for very juicy fruit, use sugar without added liquid. If sugar is scarce you can use part corn sirup or honey (p. 10), or put up fruit without sweetening.

Sugar sirup. — Make sirup by boiling sugar and water or fruit juice 5 minutes. Remove scum. For fruit juice, crush thoroughly ripe, juicy fruit and bring to boil over

low heat. Strain through jelly bag or other cloth.

Sirup	Sugar (cups)	Water or juice (cups)
Thin	1	3
Medium	1	2
Heavy	1	1

When fruit is juicy. — If you use the hot-pack method, you can add dry sugar to the raw fruit — about $\frac{1}{2}$ cup to a quart. Bring to a boil over low heat. Pack fruit in the juice that cooks out.

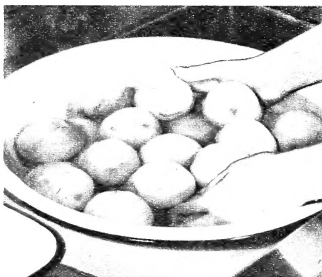
To Can Without Sugar

Sugar helps canned fruit hold its shape, color, and flavor, but it isn't needed to prevent spoilage. To can without sugar, heat fruit in its own juice, in extracted juice, or in water. Process unsweetened fruit the same as sweetened.

To sweeten fruits before serving, drain the liquid, dissolve sugar in it by heating for a few minutes, pour over the fruit, and let stand several hours.



1 Choose peaches that are sound, ripe, firm.



2 Wash fruit well. Work with only enough for one canner load at a time. Lift out of water. Don't bruise.



3 Dip peaches in boiling water just long enough to loosen skins. Then dip quickly into cold water. Use a wire basket or cheesecloth to hold the fruit.



4 Remove skins; halve and pit fruit. To keep peaches from turning dark, drop into water containing 2 tablespoons each of salt and vinegar to the gallon. Drain just before heating.

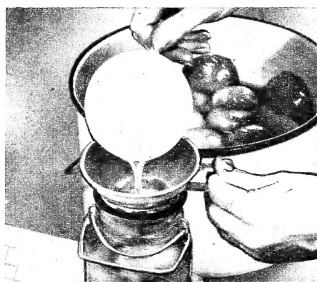
... FOR THE BOILING-WATER BATH



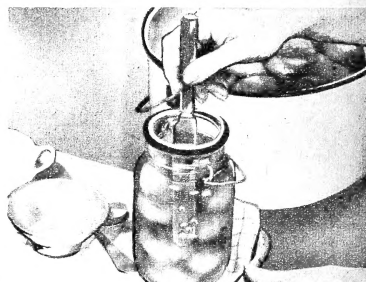
5 Put peaches in boiling sugar sirup. (See directions for sirup on page 6.) Heat fruit through but don't cook until soft.



6 Meantime, heat clean jars and lids in water. Remove from water and put hot, wet rubber ring on jar. Pack peaches loosely. Leave $\frac{1}{2}$ -inch space at top of jar.



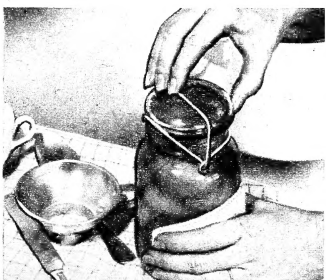
7 Cover peaches with boiling liquid, still leaving the $\frac{1}{2}$ -inch space at top of jar. It usually takes about $\frac{3}{4}$ to 1 cup of liquid to each quart jar.



8 Remove air bubbles by working the blade of a table knife down sides of jar. Add more liquid if needed to cover fruit, but be sure to have a $\frac{1}{2}$ -inch space at top of jar.



9 Wipe jar rim and rubber ring with a clean, damp cloth to remove food that might keep the jar from sealing. Put on glass lid.



10 Push long wire bail over lid into the groove at the center. Leave the short wire up. Put jars into canner as soon as they are filled.



11 When all jars are in, see that water comes over tops. Cover canner. When water boils, count time — 20 minutes for quarts and pints of peaches, at sea level. (For higher altitudes, see p. 11.)



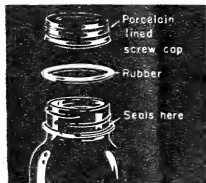
12 When time's up, take out jars. Quickly push the short wire down to complete seal. Cool jars top side up, on thick cloth or paper. Keep jars away from drafts, but don't cover.



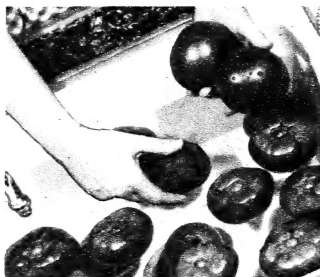
HOW TO COLD-PACK TOMATOES...

Can tomatoes to keep their fine color, tangy flavor, and vitamin C.

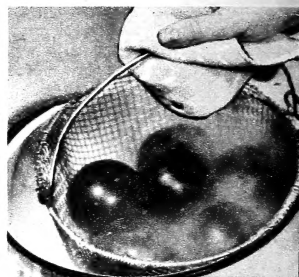
These pictures show the jar with porcelain-lined zinc cap with shoulder seal. (See p. 3 for other kinds.)



1 Inspect every tomato. Use only ripe, firm ones. Tomatoes with spoiled spots that need trimming may give a canned product poor in flavor and appearance.



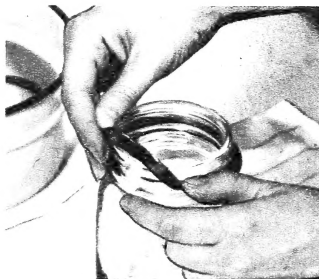
2 Wash tomatoes thoroughly. Take care not to bruise. Prepare only enough for one canner load at a time.



3 Put tomatoes in a wire basket or thin cloth. Dip into boiling water about $\frac{1}{2}$ minute, covering pan. Then dip tomatoes quickly into cold water.



4 Cut out stem ends and peel tomatoes. Cut or leave whole. In the meantime, heat clean jars and caps in water.



5 When ready to pack, take one jar at a time from hot water. Place hot, wet rubber ring on shoulder of jar.



6 Pack tomatoes into jars, pressing down enough to fill spaces. Fill jars to $\frac{1}{2}$ inch of top.



7 Add salt — $\frac{1}{2}$ teaspoon to pint jar; 1 teaspoon to quart.

. . . FOR THE BOILING-WATER BATH



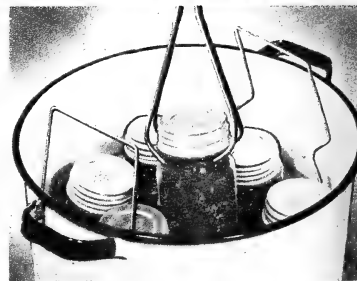
8 Remove air bubbles by working the blade of a table knife down sides of jar. Press tomatoes down with a spoon. Add more tomato if needed to fill jar again to $\frac{1}{2}$ inch of top.



9 Wipe jar rim and rubber ring with a clean, damp cloth. Food on the sealing surface may prevent an airtight seal.



10 Screw cap down tight; then turn back $\frac{1}{4}$ inch.



11 Place filled jars in canner containing hot, but not boiling water. Add boiling water if needed to bring to 1 or 2 inches over jar tops. Be careful not to pour water directly on jars.



12 Put cover on canner. When water boils begin to count time. At sea level, process pint jars of tomatoes 35 minutes; quart jars 45 minutes. (For higher altitudes, see p. 11.)



13 When time's up, remove jars from canner. Complete seal by screwing the cap on tight. Cool top side up on rack or on thick cloth or paper, away from drafts.



14 Next day test for leaks. Wipe jars with a damp cloth.



15 Label jars and store in a cool, dry place.

Sweetening Fruit

To make sugar sirup.—Boil sugar and water or fruit juice for 5 minutes. Remove scum.

Sirup	Sugar (cups)	Water or juice (cups)
Thin	1	3
Medium	1	2
Heavy	1	1

To extract juice, crush thoroughly ripe, sound, juicy fruit. Heat to boiling over low heat. Strain through jelly bag or other cloth.

For juicy fruit.—You can add sugar directly to juicy fruit, then heat without added liquid. Use about 1/2 cup sugar to a quart of fruit. Keep heat low. Pack hot.

If sugar is scarce.—Use light corn sirup or mild-flavored honey to replace as much as half the sugar called for in canning fruit.

Do not extend canning sugar with brown sugar, or with molasses, sorghum, or other strong-flavored sirups. Their flavor overpowers the fruit flavor and some of these darken the fruit.

Saccharin is not recommended.

Canning Without Sweetening

You may can fruit without sweetening—in its own juice, in extracted juice, or in water. Sugar helps fruit hold its shape, color, and flavor, but is not needed to prevent spoilage. Process unsweetened fruit the same as sweetened.

Processing Times

Processing times recommended are for fruits prepared and packed only according to directions given in this publication.

APPLES

Pare and core apples, cut in pieces. To keep fruit from darkening, drop it into water containing 2 tablespoons each of salt and vinegar per gallon. Drain, then boil 5 minutes in thin sirup or water.

In glass jars.—Pack hot fruit to 1/2 inch of top. Cover with hot sirup or water, leaving 1/2-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars... 15 min. Quart jars... 15 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot fruit to 1/4 inch of top. Fill to top with hot sirup or water. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans... 10 min. No. 2 1/2 cans... 10 min.

APPLESAUCE

Make applesauce, sweetened or unsweetened. Heat through, stirring to keep it from sticking to pan.

In glass jars.—Pack hot to 1/4 inch of top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars... 10 min. Quart jars... 10 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot to top. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans... 10 min. No. 2 1/2 cans... 15 min.

APRICOTS

Follow method for peaches. Peeling may be omitted.

BEETS, PICKLED

Cut off beet tops, leaving 1 inch of stem. Also leave root. Wash beets, cover with boiling water, and cook until tender. Remove skins and slice beets. For sirup, use 2 cups vinegar (or 1 1/2 cups vinegar and 1/2 cup water) to 2 cups sugar. Heat to boiling.

Pack hot beets in glass jars to 1/2 inch of top. Cover

with boiling pickling sirup, leaving 1/2-inch space at top of jar. Add 1/2 teaspoon salt to pints, 1 teaspoon to quarts. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars... 30 min. Quart jars... 30 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

BERRIES, EXCEPT STRAWBERRIES

HOT PACK.—(For firm berries.) Wash berries and drain well. Add 1/2 cup sugar to each quart fruit. Cover pan and bring to boil, shaking pan to keep berries from sticking.

In glass jars.—Pack hot to 1/2 inch of top. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars... 15 min. Quart jars... 15 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot to top. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans... 15 min. No. 2 1/2 cans... 20 min.

COLD PACK.—(For red raspberries and other soft berries.) Wash berries and drain well.

In glass jars.—Fill jars to 1/2 inch of top. Shake while filling for a full pack. Cover with boiling sirup, leaving 1/2-inch space at top. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars... 20 min. Quart jars... 20 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Fill cans to 1/4 inch of top. Shake down while filling for a full pack. Fill to top with boiling sirup. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans... 15 min. No. 2 1/2 cans... 20 min.

CHERRIES

Follow method for firm berries, adding a little water when heating unpanned cherries to keep them from sticking to the pan.

TOMATOES, PICKLED VEGETABLES

FRUIT JUICES

Wash, remove pits, if desired, and crush fruit. Heat to simmering. Strain through cloth bag. Add sugar, if desired— $\frac{1}{2}$ to 1 cup to 1 gallon juice.

In glass jars.—Fill hot to top. Adjust jar lids. Process in water bath with water at simmering temperature (below boiling, 180°F.)—

Pint jars . . . 20 min. Quart jars . . . 20 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Fill hot to top. Seal cans at once. Process in water bath with water at simmering temperature (below boiling, 180°F.)—

No. 2 cans . . 20 min. No. $2\frac{1}{2}$ cans . . 20 min.

FRUIT PUREES

Use sound, ripe fruit. Wash; remove pits, if desired. Cut large fruit in pieces. Simmer until soft, adding a little water if needed to keep fruit from sticking. Put through a strainer or food mill. Add sugar to taste. Heat again to simmering.

In glass jars.—Pack hot to $\frac{1}{4}$ inch of top. Adjust lids. Process in boiling-water bath (212°F.)—

Pint jars . . . 20 min. Quart jars . . . 20 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot to top. Exhaust and seal cans. Process in boiling-water bath (212°F.)—

No. 2 cans . . 20 min. No. $2\frac{1}{2}$ cans . . 20 min.

PEACHES

Wash peaches. Dip in boiling water, then quickly in cold water. Remove skins, cut peaches in halves, remove pits. Slice if desired. To prevent darkening during preparation, drop fruit into water containing 2 tablespoons each of salt and vinegar per gallon. Drain just before heating or packing cold.

HOT PACK.—Heat peaches through in hot sirup. If fruit is very juicy you may heat it with sugar, adding no liquid.

In glass jars.—Pack hot fruit to $\frac{1}{2}$ inch of top. Cover with boiling liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212°F.)—

Pint jars . . . 20 min. Quart jars . . . 20 min.
As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot fruit to $\frac{1}{4}$ inch of top. Fill to top with boiling liquid. Exhaust and seal cans. Process in boiling-water bath (212°F.)—

No. 2 cans . . 25 min. No. $2\frac{1}{2}$ cans . . 35 min.

COLD PACK.—Prepare peaches as directed above.

In glass jars.—Pack raw fruit to $\frac{1}{2}$ inch of top. Cover with boiling sirup, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212°F.)—

Pint jars . . . 25 min. Quart jars . . . 35 min.
As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack raw fruit to $\frac{1}{4}$ inch of top. Fill to top with boiling sirup. Exhaust and seal cans. Process in boiling-water bath (212°F.)—

No. 2 cans . . 25 min. No. $2\frac{1}{2}$ cans . . 35 min.

PEARS

Wash pears. Peel, cut in halves, and core. Continue as with peaches, either hot or cold pack.

PLUMS

Wash plums. To can whole, prick skins. Freestone varieties may be halved and pitted. Heat to boiling in sirup or juice. If fruit is very juicy you may heat it with sugar, adding no liquid.

In glass jars.—Pack hot fruit to $\frac{1}{2}$ inch of top. Cover with boiling liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212°F.)—

Pint jars . . . 15 min. Quart jars . . . 15 min.
As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

Work Out Air Bubbles

After filling glass jars, work the blade of a table knife down the sides to remove air bubbles. Add more liquid if needed to cover food. Be sure to leave space at top of jar as directed.

How to Exhaust Tin Cans

To exhaust, place open, filled cans in a large kettle with boiling water about 2 inches below can tops. Cover kettle, bring water back to boiling, boil 10 minutes.

You may omit this step if food is packed hot and its temperature is 170°F. or higher when cans are ready for sealing. To be sure of the temperature you will need to test it with a thermometer, placing the bulb at the center of the can. Unless you make this check, always heat the food in the open cans.

If You Don't Exhaust

After filling cans, work out air bubbles. Add more liquid if needed to fill cans to top. Seal at once and process as directed.

If You Live Above Sea Level

If you live at an altitude of 1,000 feet or more, you have to process food in a boiling-water bath for a longer time. For each 1,000 feet above sea level, add 1 minute to processing time if the time called for is 20 minutes or less. If the processing called for is more than 20 minutes, add 2 minutes for each 1,000 feet.

HOW TO CANNED FRUITS, TOMATOES, PICKLED VEGETABLES

PLUMS—continued

In tin cans.—Pack hot fruit to $\frac{1}{4}$ inch of top. Fill to top with boiling liquid. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans. 15 minutes No. 2½ cans. 20 minutes

RHUBARB

Wash rhubarb and cut into $\frac{1}{2}$ -inch pieces. Add $\frac{1}{2}$ cup sugar to each quart rhubarb and let stand to draw out juice. Bring to boiling.

In glass jars.—Pack hot to $\frac{1}{2}$ inch of top. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars. 10 minutes Quart jars. 10 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot to top. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans. 10 minutes No. 2½ cans. 10 minutes

SAUERKRAUT

Heat well-fermented sauerkraut to simmering. Do not boil.

In glass jars.—Pack hot kraut to $\frac{1}{2}$ inch of top. Cover with hot juice, leaving $\frac{1}{2}$ -inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars. 25 minutes Quart jars. 30 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot kraut to $\frac{1}{4}$ inch of top. Fill to top with hot juice. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans. 15 minutes No. 2½ cans. 20 minutes

STRAWBERRIES

Wash and stem berries. Add $\frac{1}{2}$ cup sugar to each quart of fruit. Bring slowly to a boil, shaking pan to keep fruit from sticking. Remove from stove and let stand overnight. Bring quickly to boil.

In glass jars.—Pack hot to $\frac{1}{2}$ inch of top. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars. 15 minutes Quart jars. 15 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot to top. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans. 10 minutes No. 2½ cans. 15 minutes

TOMATOES

Use only perfect, ripe tomatoes. To loosen skins, dip into boiling water for about $\frac{1}{2}$ minute; then dip quickly into cold water. Cut out stem ends and peel tomatoes.

HOT PACK.—Quarter peeled tomatoes. Bring to boil, stirring often. Pack hot in glass jars to $\frac{1}{2}$ inch of top. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars. 10 minutes Quart jars. 10 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

COLD PACK.—Leave tomatoes whole or cut in halves or quarters.

In glass jars.—Pack tomatoes to $\frac{1}{2}$ inch of top, pressing gently to fill spaces. Add no water. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust lids. Process in boiling-water bath (212° F.)—

Pint jars. 35 minutes Quart jars. 45 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack tomatoes to top, pressing gently to fill spaces. Add no water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½. Exhaust and seal cans. Process in boiling-water bath (212° F.)—

No. 2 cans. 45 minutes No. 2½ cans. 55 minutes

TOMATO JUICE

Use ripe, juicy tomatoes. Wash, remove stem ends, cut into pieces. Simmer until softened, stirring often. Put through strainer. Add 1 teaspoon salt to each quart juice. Reheat at once just to boiling.

In glass jars.—Pack boiling hot juice to $\frac{1}{4}$ inch of top. Adjust jar lids. Process in boiling-water bath (212° F.)—

Pint jars. 15 minutes Quart jars. 15 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack boiling hot juice to top. Seal cans at once. Process in boiling-water bath (212° F.)—

No. 2 cans. 15 minutes No. 2½ cans. 15 minutes



Vegetables — Fresh, Tender, Clean

Choose young, tender vegetables and can them quickly while they're fresh. "Two hours from garden to can" is a good rule. If you must hold them keep them in a cool, airy place. If you buy vegetables to can, try to get them from a nearby garden.

For best quality in the canned product, use only perfect vegetables. Sort them for size and ripeness—they cook more evenly that way.

Before peeling or cutting vegetables, wash them well. Most kinds grow close to the ground, and in soil are found some of the bacteria hardest to kill. Wash vegetables in small lots, in running water if possible, or through several changes of water. Always lift food out of the water; rinse pan thoroughly between washings. Take care not to bruise the vegetables. Don't let them soak—you lose food value.

Filling Containers

Whether you use tin cans or glass jars, have vegetables as near boiling as possible to pack into containers. Pack fairly loosely. Fill containers as directed for the vegetable you are canning (pp. 18 to 21).

Exhausting tin cans.—When tin cans are sealed, the food must be hot—at least 170°F. Food is heated to drive out air and help keep color and flavor. Sealing hot prevents bulging of can ends and breaking of seams. For the right sealing temperature pack food hot or heat in open cans (exhaust) or both. Even when food is packed hot, you'll need to re-heat before sealing if the temperature is below 170°. It's best to have a thermometer for checking the temperature.

To exhaust, heat the open filled cans of vegetables in boiling water according to the directions on page 18.

Remove cans from water one at a time. Replace any liquid spilled from the cans by filling them to the top with boiling packing liquid or water. Place clean lid on filled can. Seal at once.

Processing in Pressure Canner

Follow manufacturer's directions for your own canner. The pictures on pages 14 to 17 show how to proceed. Here are general pointers.

Put 2 or 3 inches of water in the bottom of the canner.

Set hot filled glass jars on rack so steam can flow all around each jar. Tin cans may be staggered without a rack between layers.

Fasten canner cover securely so no steam escapes except at the open pet cock or weighted gage opening.

Watch until steam pours steadily from opening. Let it escape for 10 minutes or more, so all air is driven from the canner. Then close pet cock or put on weighted gage, and let pressure rise to 10 pounds.

The moment right pressure is reached start counting time. Process for the time given in directions for the vegetable you are canning.

Keep pressure constant by regulating heat under canner. Do not lower pressure by opening pet cock. Keep drafts from blowing on canner. When time is up, slide canner away from heat.

Out of the Canner

Glass jars.—Let canner stand until pressure is zero. Never try to rush the cooling by pouring cold water over canner. When pressure registers zero, wait a minute or two—no longer—then slowly open pet cock or take off weighted gage. Unfasten cover and tilt far side up so steam escapes away from you.

As you take glass jars from canner, complete the seals at once if jars are not of the self-sealing type. Directions on page 3 tell what to do with each kind. If liquid boiled out in processing, seal jar just as it is. Do not open to add more liquid.

Cool jars top side up. Give each jar room so air can get to all sides. Never set a hot jar on a cold surface or in a draft. Don't slow down cooling by covering jars.

Tin cans.—Release steam in canner as soon as the processing time is up by opening pet cock or taking off weighted gage. Then take off canner cover.

Cool tin cans in cold, clean water, changing water as needed to cool them quickly. Take cans out of water while still warm so they will dry in the air. Stagger cans if you stack them so air can get around them.



HOW TO CAN A VEGETABLE...

All garden vegetables, except tomatoes, are canned like this (pp. 18 to 21). You can use any of the jars described on page 3, or tin cans, page 4.

These pictures show jar with self-sealing type of closure.



1 Select beans fresh from the garden — young, tender, firm, and crisp.



2 Wash beans in several waters, until every trace of sand and grit is gone. Lift them out of the water each time, so dirt that's been washed off won't be drained back over them.



3 Trim and cut beans. Prepare only enough for one canner load at a time.



4 Cover beans with boiling water and boil 5 minutes. Meantime, heat clean jars in water.



5 When you pack, take one jar from the water at a time. Use clean cloths to protect your hands and to keep hot jars off cold surface.



6 Pack hot beans loosely to $\frac{1}{2}$ inch of top. Cover with hot cooking liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Add salt — 1 teaspoon to a quart; $\frac{1}{2}$ teaspoon to a pint.



7 Remove air bubbles by working the blade of a table knife down the sides of the jar. Add more liquid if needed to fill jar to $\frac{1}{2}$ inch of top.

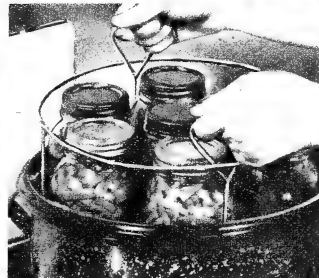
... IN A PRESSURE CANNER—in glass jars



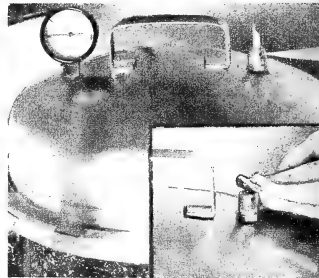
8 Wipe jar rim clean, so no speck of food will keep the lid from making an airtight seal with the jar.



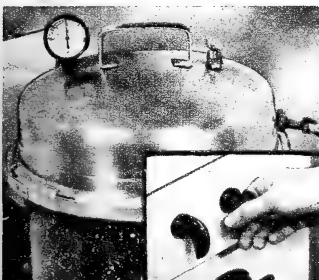
9 Place clean, hot metal lid on jar so that sealing compound is next to the glass. Screw metal band on firmly.



10 Have 2 or 3 inches of boiling water in the pressure canner. Place filled jars in canner.



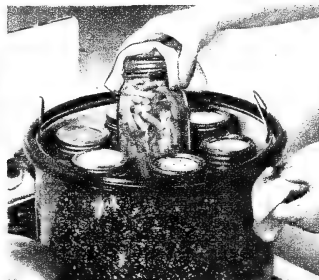
11 Fasten canner cover tight. Let steam escape from pet cock or gage opening for at least 10 minutes. Then close pet cock, or put on weighted gage. Let pressure rise to 10 pounds.



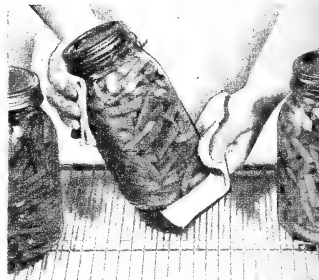
12 Process quarts of beans 25 minutes, pints 20, at sea level. (For higher altitudes, see p. 18.) Regulate heat to keep pressure steady. When time's up, slide canner from heat.



13 When pressure falls to zero wait a minute or two, no longer. Then slowly open pet cock, or take off weighted gage. Unfasten cover. Tilt far side up, away from your face.



14 Be careful not to disturb closures as you take jars from canner. Grasp the glass shoulder, not the metal band. This closure is a self-sealing type, so don't tighten it further.



15 Let jars cool on rack or thick cloth, out of drafts. Next day take off screw bands if you can without forcing. Covering for a moment with a hot, damp cloth may help loosen band.

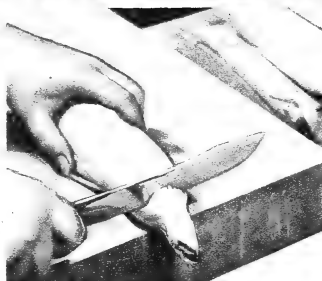
Keep pressure even, to hold juice in jars

HOW TO CAN A VEGETABLE...

These pictures show the steps in canning whole-kernel corn in tin cans. Other vegetables are canned in a similar way (pp. 18 to 21).

To prevent corn from turning dark, use the C-enamel tin can. For kinds of cans to use for other foods, see page 4.

Check tin cans and lids for defects before starting to can. Do not use any that are badly bent, dented, or rusted or that have scratched or torn gaskets.



1 Choose corn at just the right stage for eating. Cut both ends from ears of corn for easy husking.



2 Remove husks. Discard poorly developed, diseased, and badly infested ears.



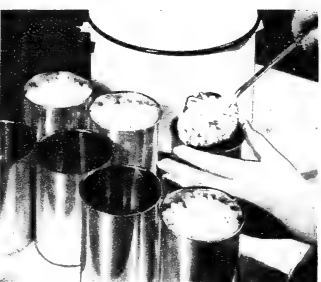
3 Remove silk — a vegetable brush is handy for this purpose. Wash ears of corn.



4 For whole-kernel corn, cut with a smooth stroke at about two-thirds the depth of kernels. Use a sharp knife. A nail through cutting board at an angle, will hold the cob steady.



5 Measure corn into cooking pan. Cook 2 or 3 quarts at a time. Add one-half as much boiling water as corn. Cover pan and let mixture come to a rolling boil.



6 Fill clean cans with hot corn, leaving $\frac{1}{2}$ -inch space at top. Add $\frac{1}{2}$ teaspoon salt to a No. 2 can; 1 teaspoon to a No. $2\frac{1}{2}$ can.



7 Fill cans to top with hot cooking liquid.

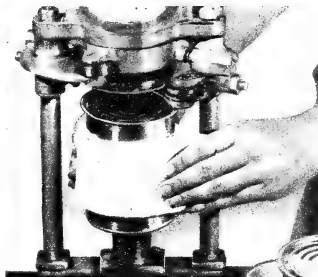
... IN A PRESSURE CANNER—in tin cans



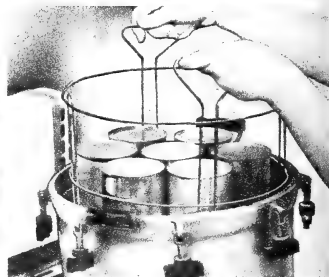
8 To bring to right sealing temperature, place open cans in a kettle with boiling water to within 2 inches of can tops. Cover kettle, bring water back to boiling, boil 10 minutes.



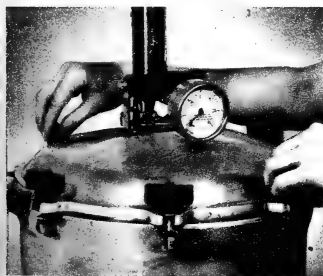
9 Remove cans from kettle. Wipe lid with a damp cloth to remove any dust or dirt before placing it on can.



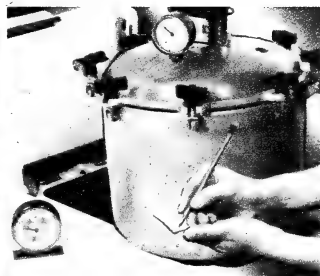
10 Seal cans at once. A folded towel protects the hands while cans are lifted to platform of sealer. While sealing one lot of filled cans, heat another lot.



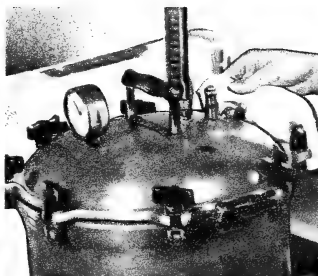
11 Lower rack of sealed cans into pressure canner which has 2 or 3 inches of boiling water in the bottom. Stagger cans if a second layer is placed on the first.



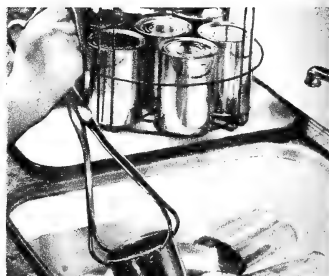
12 Fasten cover. Be certain pet cock is open or weighted gage is left off. Use full heat. Let steam escape at least 10 minutes. Close pet cock or put on weighted gage.



13 When pressure reaches 10 pounds, count time—60 minutes for No. 2 and No. 2½ cans of corn, at sea level. (For higher altitudes, see p. 18.) Regulate heat to keep pressure even.



14 At end of processing time, slowly open pet cock or take off weighted gage to release steam. When pressure is zero, take cover off canner, tilting far side up to protect your face.



15 Plunge cans at once into cold, clean water. Remove them from water when slightly warm so they will dry. Stagger cans if you stack them, to aid in cooling and drying.

See that sealer is in good working order

Work Out Air Bubbles

Work the blade of a table knife down sides of filled jars to remove air bubbles. Add more liquid if needed to cover food, leaving space at top of jar as directed.

How to Exhaust Tin Cans

To exhaust, place open, filled cans in a large kettle with boiling water about 2 inches below can tops. Cover kettle, bring water back to boiling, boil 10 minutes.

You may omit this step if temperature of hot-packed food is 170° F. or higher when you're ready to seal cans. To be sure food is hot enough, take temperature at center of can with a thermometer. Unless you do this, always exhaust.

If You Don't Exhaust

After filling cans, work out air bubbles. Add more liquid if needed to fill cans to top. Seal at once, and process as directed.

Process at 240° F.

Before closing pressure-canner vent, be sure steam pours out for at least 10 minutes so all air is driven from canner. Otherwise, the temperature may not reach 240° F.

If You Live Above Sea Level

At altitudes above sea level, it takes more than 10 pounds pressure to reach 240° F. You need to increase pressure by 1 pound for each 2,000 feet altitude. A weighted gage may need to be corrected for altitude by the manufacturer.

ASPARAGUS

Wash asparagus; trim off scales and tough ends and wash again. Cut into 1-inch pieces. Cover with boiling water. Boil 2 or 3 minutes.

In glass jars.—Pack hot asparagus to $\frac{1}{2}$ inch of top. Cover with hot cooking liquid, or if liquid contains grit use boiling water. Leave $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).—

Pint jars . . . 25 min. Quart jars . . . 55 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot asparagus to $\frac{1}{4}$ inch of top. Fill to top with hot cooking liquid, or if liquid contains grit use boiling water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).—

No. 2 cans . . . 20 min. No. 2 $\frac{1}{2}$ cans . . . 20 min.

BEANS, FRESH LIMA

Can only young, tender beans. Shell; wash. Cover beans with boiling water and bring to boil.

In glass jars.—Pack hot beans to 1 inch of top. Cover with boiling water, leaving 1-inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).—

Pint jars . . . 35 min. Quart jars . . . 60 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot beans to $\frac{1}{2}$ inch of top. Fill to top with boiling water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).—

No. 2 cans . . . 40 min. No. 2 $\frac{1}{2}$ cans . . . 40 min.

BEANS, SNAP

Wash beans. Trim ends; cut into $\frac{1}{2}$ -inch pieces. Cover with boiling water; boil 5 minutes.

In glass jars.—Pack hot beans to $\frac{1}{2}$ inch of top. Cover with hot cooking liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).—

Pint jars . . . 20 min. Quart jars . . . 25 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot beans to $\frac{1}{4}$ inch of top. Fill to top with hot cooking liquid. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).—

No. 2 cans . . . 25 min. No. 2 $\frac{1}{2}$ cans . . . 30 min.

BEETS

Sort for size. Cut off beet tops, leaving an inch of stem. Also leave root. Wash beets. Cover with boiling water and boil until skins slip easily—15 to 25 minutes, depending on size. Skin and trim. Leave baby beets whole. Cut medium or large beets in $\frac{1}{2}$ -inch slices; halve or quarter very large slices.

In glass jars.—Pack hot beets to $\frac{1}{2}$ inch of top. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).—

Pint jars . . . 25 min. Quart jars . . . 55 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot beets to $\frac{1}{4}$ inch of top. Fill to top with boiling water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).—

No. 2 cans . . . 30 min. No. 2 $\frac{1}{2}$ cans . . . 30 min.

BEETS, PICKLED. See page 10.

CARROTS

Wash and scrape carrots. Slice or dice. Cover with boiling water and bring to boil.

In glass jars.—Pack hot carrots to $\frac{1}{2}$ inch of top. Cover with hot cooking liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).

Pint jars . . . 20 min. Quart jars . . . 25 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot carrots to $\frac{1}{4}$ inch of top. Fill with hot cooking liquid. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).

No. 2 cans . . 20 min. No. 2 $\frac{1}{2}$ cans . . 25 min.

CORN, CREAM-STYLE

Husk corn and remove silk. Wash. Cut corn from cob at about center of kernel and scrape cobs. To each quart of corn add 1 pint boiling water. Heat to boiling.

In glass jars.—Use pint jars only. Pack hot to 1 inch of top. Add $\frac{1}{2}$ teaspoon salt to each jar. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).

Pint jars . . . 85 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Use No. 2 cans only. Pack hot to top. Add $\frac{1}{2}$ teaspoon salt to each can. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).

No. 2 cans . . . 105 minutes

CORN, WHOLE-KERNEL

Husk corn and remove silk. Wash. Cut from cob at about two-thirds the depth of kernel. To each quart of corn add 1 pint boiling water. Heat to boiling.

In glass jars.—Pack hot corn to 1 inch of top. Cover with hot cooking liquid, leaving 1-inch space at top of jar. Or fill to 1 inch of top with mixture of corn and liquid. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).

Pint jars . . . 55 min. Quart jars . . . 85 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot corn to $\frac{1}{2}$ inch of top and fill to top with hot cooking liquid. Or fill to top with mixture of corn and liquid. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).

No. 2 cans . . 60 min. No. 2 $\frac{1}{2}$ cans . . 60 min.

OKRA

Can only tender pods. Wash; trim. Cook for 1 minute in boiling water. Cut into 1-inch lengths or leave pods whole.

In glass jars.—Pack hot okra to $\frac{1}{2}$ inch of top. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.).

Pint jars . . . 25 min. Quart jars . . . 40 min.

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot okra to $\frac{1}{4}$ inch of top. Fill to top with boiling water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.).

No. 2 cans . . 25 min. No. 2 $\frac{1}{2}$ cans . . 35 min.

Processing Times

Processing times recommended are for vegetables prepared and packed only according to directions given in this publication.

To Figure Yield of Canned Vegetables From Fresh

Legal weight of a bushel of a vegetable varies in different States. These are average weights:

Vegetable	Fresh	Canned
Asparagus	1 bu. (45 lb.) 4 lb.	11 qt. 1 qt.
Beans, lima	1 bu. (32 lb.) 4-5 lb.	6-8 qt. 1 qt.
Beans, snap	1 bu. (30 lb.) 1 $\frac{1}{2}$ -2 lb.	15-20 qt. 1 qt.
Beets, without tops	1 bu. (52 lb.) 2 $\frac{1}{2}$ -3 lb.	17-20 qt. 1 qt.
Carrots, without tops	1 bu. (50 lb.) 2 $\frac{1}{2}$ -3 lb.	16-20 qt. 1 qt.
Corn, sweet, in husks	1 bu. (35 lb.) 6-16 ears	8-9 qt. 1 qt.
Okra	1 bu. (26 lb.) 1 $\frac{1}{2}$ lb.	17 qt. 1 qt.
Peas, green, in pods	1 bu. (30 lb.) 2-2 $\frac{1}{2}$ lb.	12-15 pt. 1 pt.
Pumpkin	50 lb. 3 lb.	15 qt. 1 qt.
Spinach	1 bu. (18 lb.) 2-3 lb.	6-9 qt. 1 qt.
Squash, summer	1 bu. (40 lb.) 2-2 $\frac{1}{2}$ lb.	16-20 qt. 1 qt.
Sweet potatoes	1 bu. (55 lb.) 2 $\frac{1}{2}$ -3 lb.	18-22 qt. 1 qt.

PEAS, GREEN

Shell and wash peas. Cover with boiling water. Bring to boil.

In glass jars.—Pack hot peas to 1 inch of top. Cover with boiling water, leaving 1-inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars.....40 minutes Quart jars.....40 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot peas to $\frac{1}{4}$ inch of top. Fill to top with boiling water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Exhaust and seal cans. Process at 10 pounds pressure (240° F.)—

No. 2 cans.....30 minutes No. 2½ cans.....30 minutes

PUMPKIN, CUBED

Wash, remove seeds, and peel pumpkin. Cut into 1-inch cubes. Add just enough water to cover; bring to boil.

In glass jars.—Pack hot cubes to $\frac{1}{2}$ inch of top. Cover with hot cooking liquid, leaving $\frac{1}{2}$ inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars.....55 minutes Quart jars.....90 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot cubes to $\frac{1}{4}$ inch of top. Fill to top with hot cooking liquid. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2½ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans.....50 minutes No. 2½ cans.....75 minutes

PUMPKIN, STRAINED

Wash, remove seeds, and peel pumpkin. Cut into inch cubes. Steam until tender, about 25 minutes. Put through food mill or strainer. Simmer until heated through, stirring to keep from sticking to pan.

In glass jars.—Pack hot to $\frac{1}{2}$ inch of top. Add no liquid or salt. Adjust jar lids. Process at 10 pounds pressure (240° F.)—

Pint jars.....60 minutes Quart jars.....80 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot to $\frac{1}{8}$ inch of top. Add no liquid or salt. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans.....75 minutes No. 2½ cans.....90 minutes

SAUERKRAUT. See page 12.

SPINACH

Can only freshly picked, tender spinach. Pick over and wash thoroughly. Cut out tough stems and midribs. Place about 2½ pounds of spinach in a cheesecloth bag and steam about 10 minutes or until well wilted.

In glass jars.—Pack hot spinach loosely to $\frac{1}{2}$ inch of top. Cover with boiling water, leaving $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{4}$ teaspoon salt to pints; $\frac{1}{2}$ teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars.....45 minutes Quart jars.....70 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot spinach loosely to $\frac{1}{4}$ inch of top. Fill to top with boiling water. Add $\frac{1}{4}$ teaspoon salt to No. 2 cans; $\frac{1}{2}$ teaspoon to No. 2½ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans.....60 minutes No. 2½ cans.....75 minutes

SQUASH, SUMMER

Wash; do not peel. Trim ends. Cut squash into $\frac{1}{2}$ -inch slices; halve or quarter to make pieces of uniform size. Add just enough water to cover. Bring to boil.

In glass jars.—Pack hot squash to $\frac{1}{2}$ inch of top. Cover with hot cooking liquid, leaving $\frac{1}{2}$ -inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars.....30 minutes Quart jars.....40 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

VEGETABLES

In tin cans.—Pack hot squash to $\frac{1}{4}$ inch of top. Fill to top with hot cooking liquid. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans. 20 minutes No. 2 $\frac{1}{2}$ cans. 20 minutes

SQUASH, WINTER

Prepare, pack, and process like pumpkin.

SWEETPOTATOES, DRY PACK

Wash sweetpotatoes. Sort for size. Boil or steam until partially soft (20 to 30 minutes). Skin. Cut in pieces if large.

In glass jars.—Pack hot sweetpotatoes tightly to 1 inch of top, pressing gently to fill spaces. Add no salt or liquid. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars. 65 minutes Quart jars. 95 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot sweetpotatoes tightly to top of can, pressing gently to fill spaces. Add no salt or liquid. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans. 80 minutes No. 2 $\frac{1}{2}$ cans. 95 minutes

SWEETPOTATOES, WET PACK

Wash sweetpotatoes. Sort for size. Boil or steam just until skins slip easily. Skin and cut in pieces.

In glass jars.—Pack hot sweetpotatoes to 1 inch of top. Cover with boiling water, leaving 1-inch space at top of jar. Add $\frac{1}{2}$ teaspoon salt to pints; 1 teaspoon to quarts. Adjust jar lids. Process in pressure canner at 10 pounds pressure (240° F.)—

Pint jars. 55 minutes Quart jars. 90 minutes

As soon as you remove jars from canner, complete seals if closures are not of self-sealing type.

In tin cans.—Pack hot sweetpotatoes to $\frac{1}{4}$ inch of top. Fill to top with boiling water. Add $\frac{1}{2}$ teaspoon salt to No. 2 cans; 1 teaspoon to No. 2 $\frac{1}{2}$ cans. Exhaust and seal cans. Process in pressure canner at 10 pounds pressure (240° F.)—

No. 2 cans. 70 minutes No. 2 $\frac{1}{2}$ cans. 90 minutes

DAY-AFTER-CANNING JOBS

When glass jars have cooled overnight, take off screw bands that have a glass or metal lid underneath if you want to use them on other jars. If a band sticks, covering for a moment with a hot, damp cloth may help loosen it. Do not use force or you may break the seal.

Test seal by turning jar partly over in your hands. If you find a leaky jar, use unspiced food right away. Or can it again—empty the jar, heat food, pack, and process as if it were fresh. Before using jar or lid again, check for defects (p. 3). With a flat metal lid another test is to tap center of lid with a spoon. A clear, ringing sound means a good seal. A dull note does not always mean a poor seal; if there's no leakage, store jar and watch for signs of spoilage.

Before storing canned food, wipe containers clean. Label to show contents, date, and lot number if you canned more than one lot in a day.

STORE CANNED FOOD COOL AND DRY

Warmth may cause canned food to lose quality. Hot pipes behind a wall sometimes make a shelf or closet too warm for storing food.

Freezing may crack a jar or break a seal and let in bacteria that will cause spoilage. If it does not damage jar or seal, freezing will not make food unsafe to eat but may cause undesirable changes in flavor and texture. In an unheated place you can give canned food some protection by covering with a blanket or wrapping in paper.

Dampness may corrode tin cans and metal lids of glass jars and eventually cause leakage.

ON GUARD AGAINST SPOILAGE

Don't use canned food that shows any sign of spoilage. Look closely at each container before opening it. Bulging can ends, jar lids, or rings, or a leak—these may mean food has spoiled. When you open a container look for other signs—spurting liquid, an off odor, or mold.

It's possible for canned vegetables to contain the poison causing botulism—a serious food poisoning—without showing signs of spoilage. There is no danger of botulism if pressure canner is in perfect order and every canning step is done correctly. But unless you're absolutely sure of your gage and canning methods, boil home-canned vegetables before tasting. Heating usually makes any odor of spoilage more evident.

Bring vegetables to a rolling boil; then cover and boil for at least 10 minutes. Boil spinach and corn 20 minutes. If the food looks spoiled or has an off odor during heating, destroy it.

Burn spoiled vegetables, or dispose of the food so that it will not be eaten by humans or animals.

QUESTIONS AND ANSWERS

Q. How are safe process times for canned foods determined?

A. Safe canning processes are based on laboratory studies. The process times for vegetables given in this publication are the result of extensive research by the Bureau of Human Nutrition and Home Economics.

More than 3,700 glass jars and tin cans of vegetables were packed and processed in household-type containers. Penetration of heat into containers of food during processing was studied. From the data obtained and data on the heat resistance of known spoilage organisms, process times were calculated. These times were checked by experimental packs inoculated with spores of bacteria somewhat more resistant to heat than spores of the bacteria that cause botulism.

Process times previously recommended for vegetables by the United States Department of Agriculture were based on commercial research, as are those given here for fruit. The new, more precisely determined directions for vegetables are based on home canning procedures and equipment. They call for shorter heating in the canner in many instances, and result in more attractive and palatable products. Additional studies in home canning may permit further improvements in procedures and processes.

Q. Is it safe to process foods in the oven?

A. No, oven canning is dangerous. Jars may seal during processing and explode, wrecking the stove and seriously cutting or burning persons. The temperature of the food in the jars during oven processing does not get high enough to insure destruction of spoilage bacteria in vegetables without exceedingly long processes.

Q. Why is the open-kettle method not recommended for canning fruits and vegetables?

A. In open-kettle canning, food is cooked in an ordinary kettle, then packed into hot jars and sealed without processing. When the food is transferred from kettle to jar, bacteria may get in and cause food to spoil. And for vegetables, the temperatures obtained in open-kettle canning are not high enough to destroy all the spoilage organisms that may be in the food unless it is cooked for an excessively long time.

Q. May a pressure canner be used for processing fruits?

A. Yes. If it is deep enough it may be used as a water-bath canner (p. 2).

Or you may use a pressure canner to process fruits at 0 to 1 pound pressure without having the containers of food completely covered with water. Put water in the canner to the shoulders of the jars; fasten cover. When live steam pours steadily from the open vent, start counting time. Leave vent open and process for the same times given for the boiling-water bath.

Processing of fruits at 5 or 10 pounds steam pressure is being studied, but information is not sufficiently complete to use for process-time recommendations.

Q. Must glass jars and lids be sterilized by boiling before canning?

A. No, not when boiling-water bath or pressure-canner method is used. The containers as well as the food are sterilized during processing. But be sure jars and lids are thoroughly clean, and to prevent breakage have jars hot when filling them.

Q. Why is the cooking liquid used for packing some vegetables and boiling water for others?

A. Cooking liquid is recommended for packing most vegetables because it may contain minerals and vitamins dissolved out of the food. Boiling water is recommended when cooking liquid is dark, gritty, or strong-flavored, and it may be used if you haven't enough cooking liquid. Processing time is the same whether hot cooking liquid or boiling water is used for packing.

Q. Why is liquid sometimes lost from glass jars during processing?

A. Loss of liquid may be due to cooking food too short a time to drive out the air that's in it before packing it in the jars . . . packing jars too full . . . leaving air bubbles in the jars . . . not keeping pressure steady in a pressure canner . . . lowering pressure too suddenly at the end of the processing period.

Q. Should liquid lost during processing be replaced?

A. No, never open a jar and refill with liquid—this would let in bacteria and you'd need to process again. Loss of liquid does not cause food to spoil, though the food above the liquid may darken.

ON HOME CANNING???

Q. What causes cloudy liquid in canned fruits and vegetables?

A. Cloudy liquid may be a sign of spoilage. Or it may be caused by the minerals in hard water, or by starch from overripe vegetables.

Q. How can you tell whether food with cloudy liquid is spoiled?

A. Boil the food and note the odor. Do not taste or use any food having an off odor (p. 21).

Q. Why does canned fruit sometimes float in jars?

A. Fruit may float because the pack is too loose or the sirup too heavy. Or perhaps air in the tissues of the fruit has not all been forced out during heating and processing.

Q. What makes canned foods change color?

A. Darkening of foods at the tops of jars may be caused by oxidation due to air in the jars or by too little heating or processing to destroy enzymes. Overprocessing may cause discoloration of foods throughout the containers.

Pink and blue colors sometimes seen in canned pears, apples, and peaches are caused by chemical changes in the coloring matter of the fruit.

-Iron and copper from utensils used in preparing foods, or from the water in some localities, may cause brown, black, and gray colors in some foods.

When canned corn turns brown, the discoloring may be due to the variety of corn, to the stage of ripeness, or to overprocessing.

A common cause of fading of highly colored foods is the dissolving of coloring materials by the packing liquid. The use of plain tin cans will cause some foods to lose color (p. 4).

Q. Is it safe to eat discolored canned foods?

A. The color changes noted above do not mean the food is unsafe to eat. However, spoilage may also cause color changes. Any canned food

that has an unusual color should be examined carefully before use (p. 21).

Q. Is it true that ascorbic acid helps keep fruits and vegetables from darkening?

A. The addition of 250 milligrams of ascorbic acid (vitamin C) to a quart of fruit or vegetable before it is processed retards oxidation, which is one cause of darkening of canned foods.

Q. Is it all right to use preservatives in home canning?

A. Do not use canning powders or other chemical preservatives—some of them may be harmful. Sterilization by heat is safer and more certain.

Q. Why does the under side of metal lids sometimes discolor?

A. Natural compounds in some foods corrode the metal and make a brown or black deposit on the under side of the lid. This deposit is harmless and doesn't mean that the food in the jar is unsafe to eat.

Q. When canned or frozen fruits are bought in large containers, is it possible to can them in smaller containers?

A. Any canned or frozen fruit may be heated through, packed, and processed the same length of time as recommended for freshly prepared food. This canned food may be of lower quality than if it had been canned when fresh.

Q. Is it safe to leave food in tin cans after opening?

A. Yes, but like fresh-cooked food, food in tin cans needs to be covered and kept in a refrigerator or other cold place.

Q. Why have processing times for mixtures of food like mixed vegetables, soups, and stews not been included in this pamphlet? And why are only pint and quart glass jars and No. 2 and 2½ tin cans recommended?

A. Processing times have been given for only those low-acid vegetables and sizes of containers on which research has been completed by this Bureau. Processing times for some mixtures are now being studied.

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